

STANDARD FOR PIPE
IDENTIFICATION IN WATER AND
WASTEWATER TREATMENT
PLANTS IN ONTARIO

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Environment
Ontario

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Minister

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ACKNOWLEDGEMENTS

This standard was prepared by a Committee constituted as follows:

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The draft report was reviewed by the MOE Water Resources Branch,
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STANDARD FOR PIPE IDENTIFICATION IN WATER AND WASTEWATER TREATMENT PLANTS IN ONTARIO

The identification of workplace hazardous materials and provision of detailed hazard information to workers has been an issue of concern for some time. The Ministry of the Environment owns and operates a number of Water and Waste Water Treatment Plants (WTP, WWTP) in the Province and at present, there are various systems used for identification of piping. A committee was formed to develop a standardized system for identification of contents and flow direction within a pipe network, which could be used for both water and wastewater treatment plants.

The primary purpose of identification of piping systems clearly must be to provide immediate recognition of potential danger. If colour coding/labelling is to assist in achieving this purpose, then the system must be simple. A secondary reason for identification of piping systems is to assist in recognition for operation, sampling and maintenance purposes.

The long range goal is to achieve a standardized colour coding/labelling system in use throughout the Province.

With a standardized identification system there are three principal benefits:

1. In the case of an accident or time of emergency, it alerts plant operating personnel immediately to the contents of the pipe and the corresponding hazards involved. This allows for a quicker response in taking corrective or evasive action, minimizing the risk of major property damage or personal injury.
2. Operating efficiency is enhanced by using a standardized identification system to lessen the confusion inherent in complex process piping systems. Operation and maintenance

personnel can quickly differentiate between piping systems, eliminating the need for costly pipe tracing during maintenance or change of operating procedures. Also, errors and accidents caused by maintenance or contractors cutting into the wrong pipe or servicing the wrong piece of equipment will be reduced.

3. A standardized identification system simplifies operator training. New operators will quickly learn piping layouts and process systems within the plant. Standardization is especially useful when the same staff operate several plants. It allows them to become more productive and reduces the chance of error.

In keeping with the primary and secondary purposes noted above and meeting mandatory requirements, the following system was developed:

PIPE IDENTIFICATION SYSTEM

I. FLAMMABLE

For piping systems containing flammable gases or liquids - gasoline, fuel oil, digester gas, acetylene, propane, etc.

Colour



YELLOW-ORANGE; Canadian General Standards Board (CGSB) 508-103, plus identification labels consisting of black lettering and arrows on a yellow-orange background.

Method

- (a) either complete painting of all piping, valves and fittings plus labelling every linear 3 meters maximum identifying the contents and the direction of flow (comply with Occupational Health and Safety Act (OHSA) 66(1)(a), (b) and (c));
- (b) or the same as (a) except that piping may be colour banded every linear 3 meters maximum rather than completely painted. Banding with adhesive tape is recommended (comply with OHSA 66(1)(a), (b) and (c)). Colour coded painting of ferrous fittings such as flanges, valves, couplings, etc. is recommended.

II. FIREFIGHTING

For piping systems containing firefighting substances - water, carbon dioxide, etc.

Colour



RED; CGSB 509-102 plus identification labels consisting of white lettering and arrows on a red background.

Method

Identical to piping systems containing flammable gases or liquids.

III DANGEROUS SUBSTANCES

For other piping systems containing dangerous (highly hazardous) substances - chlorine gas, fluosilicic acid, other concentrated acids or caustics, etc. - i.e. - strongly corrosive, strongly toxic, temperature greater than 80°C (175°F) including steam, pressure greater than 700 kPa (100 psi).

Colour



YELLOW: CGSB 505-110 plus identification labels consisting of black lettering and arrows on a yellow background.

Method

Identical to piping systems containing flammable gases or liquids.

IV OTHER CHEMICAL SUBSTANCES

For other piping systems containing chemical substances (not highly dangerous) - chlorine solutions, sodium hypochlorite, alum, polyelectrolytes, lime solutions, fluoride solutions, etc. - i.e. - mildly corrosive, mildly toxic, temperature less than 80°C (175°F), pressure less than 700 kPa (100 psi).

Colour









NEUTRAL OR BACKGROUND (colour of wall); identification labels consisting of black lettering and arrows on a white background.

Method

Label every 10 meters maximum identifying the contents and the direction of flow (comply with OHS 66(1)(a), (b) and (c) - i.e. - colour coded painting or banding not required, only labelling to identify contents and direction.

V. PROCESS & DRAINAGE

For process and drainage, etc. piping systems, one colour for water being protected, one for sludges and one for other water and drainage systems. Within each group colour gradations to reflect the degree of contamination, as follows:

<u>Description of Contents</u>	<u>Colour</u>	<u>CGSB Code</u>	<u>Colour Sample</u>
Raw water	<u>dark blue</u>	502-103	
Settled water	<u>mid blue</u>	502-208	
Finished or potable water	<u>light blue</u>	502-106	
Raw sewage, sanitary waste	<u>mid grey</u>	501-103	
Non-potable water (- heating system), drainage, effluent water, final effluent	<u>light grey</u>	501-108	
WTP sludges, WWTP raw sludge and scum	<u>dark brown</u>	504-102	
WTP backwash waste, WWTP return and waste activated sludge, digested sludge	<u>mid brown</u>	504-107	
WTP settled backwash, WWTP supernatant, centrate	<u>light brown</u>	505-206	

Method

Identical to piping systems containing flammable gases and liquids except labelling should occur at 10 meter rather than 3 meter intervals and should consist of white lettering and arrows on a background colour which matches the colour code for the pipe.

IDENTIFICATION LABELS

For simplicity, identification labels can be purchased with the standard CGSB background colours and paint can be purchased locally to match a sample of the identification label (see Appendix I - Paint Specifications and Samples).

There are several types of identification label materials available. The pipe size, material of pipe and/or insulation surface, working temperature range and environment (indoors, outdoors, etc.) lettering and arrow size should be specified when ordering labels.

Pipe/Label Letter Sizes

<u>Outside Pipe Diameter</u>	<u>Letter Size</u>
less than or equal to 25 mm	12 mm
greater than 25 mm - less than 100 mm	25 mm
equal or greater than 100 mm	50 mm

It is suggested that lettering and arrows be on separate labels.

Examples of identification labels available are:

- (a) Vinyl Cloth - General purpose pressure sensitive adhesive of high tensile strength - service temperature -40° to 65°C.
- (b) Perma-Code Markers - For problem pipes - insulated or rough surface - pressure sensitive - thin film - conformable - temperature -40° to 100°C.

- (c) Pressure Sensitive Film - printed with weather resistant inks for outdoor durability - temperature -40° to 80°C.

The above identification labels are available from W.H. Brady Inc. (labels from other suppliers should be of equal quality).

TAGGING OR REMOVAL OF ABANDONED PIPING AND EQUIPMENT

Abandoned piping is often found in several areas of plants such as the primary control building, the sedimentation pipe gallery and the chemical storage and feed area. These lines should either be tagged as abandoned or removed.

Only functional piping and equipment should be colour coded and/or labelled. In areas where pipe crowding is a problem, removal would free needed space, providing greater access and visibility to plant personnel.

If removal of old piping is not an acceptable alternative, then each of the abandoned lines and appropriate isolating valve should be tagged as "abandoned". This will help eliminate confusion and potentially dangerous situations.

RECOMMENDATIONS

This system for pipe identification has been endorsed by the MOE Utility Operations Managers Committee and effective March 31, 1988 should be implemented by all MOE Water and Wastewater Treatment Plants. This would involve immediate labelling of all pipes to conform to the Ministry of Labour's "Workplace Hazardous Materials Information System" (WHMIS) Policy - effective October 31, 1988, and a phased-in program of painting of pipes over the next five years.

To ensure a standard system is used throughout the Province, this standard should be recommended to all other operating authorities in Ontario.

Copies of this standard should be registered with the following:

1. MOE - (i) Water Resources Branch
(ii) Project Engineering Branch
(iii) Approvals Branch
(iv) Regional Safety Committee
(v) Regional Office.
2. Municipal Engineers Association.
3. American Water Works Association - Ontario Section.
4. Consulting Engineers Association of Ontario.
5. Canadian Standards Association.
6. Ministry of Labour.
7. Canadian General Standards Board.
8. Canadian Gas Association.
9. Fire Marshall's Office.
10. All local Fire Departments.

APPENDIX I

Standard for Pipe Identification in Water and Wastewater Treatment Plants in Ontario

Paint Specifications and Samples:

CGSB #508-103



CGSB #501-103



CGSB #509-102



CGSB #501-108



CGSB #505-110



CGSB #504-102



CGSB #502-103



CGSB #504-107



CGSB #502-208



CGSB #505-206



CGSB #502-106



